

WHAT IS CLAIMED IS:

1. A driver for a motor to move an object, comprising:  
a movement difference calculator that calculates a difference  
between an amount of movement of the object and a target value; and  
5 a motor controller that controls the motor so that the object  
moves at a constant velocity, based on the difference.
2. The driver according to claim 1, further comprising a pulse  
frequency calculator that calculates a pulse frequency for driving the  
10 motor, based on the difference and a reference pulse frequency,  
wherein  
the motor is a pulse motor, and  
the motor controller controls the pulse motor so that the object  
moves at a constant velocity, based on the pulse frequency calculated.  
15
3. The driver according to claim 1, wherein  
the object is a rotor,  
the amount of movement is an angular displacement of the rotor,  
and  
20 the motor controller controls the motor so that the rotor rotates  
at a constant angular velocity, based on the difference.
4. The driver according to claim 1, wherein  
the object is a drive rotor that turns a driven rotor through a belt  
25 that is wound around between the drive rotor and the driven rotor.

5. The driver according to claim 1, wherein  
the object is a driven rotor that is turned through a belt that is  
wound around between the driven rotor and a drive rotor, and  
5 the drive rotor is turned by the motor.

6. The driver according to claim 1, wherein the object is a belt that  
is wound around between a drive rotor and a driven rotor, and  
the drive rotor is turned by the motor.

10

7. The driver according to claim 1, wherein the pulse frequency  
calculator includes a low-pass filter that shapes a waveform of the  
difference.

15 8. The driver according to claim 1, wherein the pulse frequency  
calculator includes a low-pass filter and a multiplier.

9. The driver according to claim 1, further comprising:  
a movement measuring unit that measures the amount of  
20 movement.

10. The driver according to claim 9, further comprising a resolution  
of the movement measuring unit is greater than a double amplitude of a  
main variation component of the object.

25

11. The driver according to claim 9, wherein the movement measuring unit is a rotary encoder.

12. The driver according to claim 9, wherein the movement  
5 measuring unit is a linear encoder.

13. The driver according to claim 11, wherein  
the object is a belt that is wound around between a drive rotor  
turned by the motor and a driven rotor, and  
10 the rotary encoder is provided on the driven roller.

14. The driver according to claim 11, wherein  
the object is a belt that is wound around between a drive rotor  
turned by the motor and a driven rotor, and  
15 the rotary encoder is provided on the drive roller.

15. The driver according to claim 12, wherein  
the object is a belt that is wound around between a drive rotor  
turned by the motor and a driven rotor, and  
20 the linear encoder is provided on the belt.

16. An image forming apparatus comprising:  
an image carrier;  
a motor to move the image carrier;  
25 a movement measuring unit that measures an amount of

movement of the image carrier;

a movement difference calculator that calculates a difference between the amount of movement and a target value; and

a motor controller that controls the motor so that the image  
5 carrier moves at a constant velocity, based on the difference.

17. The image forming apparatus according to claim 16, wherein the image carrier is a photosensitive drum.

10 18. The image forming apparatus according to claim 16, wherein the image carrier is a photosensitive belt.

19. The image forming apparatus according to claim 16, wherein the image carrier is a transfer drum.

15

20. The image forming apparatus according to claim 16, wherein the image carrier is a transfer belt.

21. The image forming apparatus according to claim 16, wherein  
20 the image carrier includes a plurality of image carriers that carry toner images of a plurality of colors, and  
the toner images are sequentially superposed on a belt-like image carrier to form a color image.

25

22. An image reading apparatus comprising:  
an object including an optical system for image reading;  
a motor to move the object along a plane of a target to be read;  
a movement measuring unit that measures an amount of  
5 movement of the object;  
a movement difference calculator that calculates a difference  
between the amount of movement and a target value; and  
a motor controller that controls the motor so that the object  
moves at a constant velocity, based on the difference.
- 10
23. A method of driving a motor to move an object, comprising:  
measuring an amount of movement of the object;  
calculating a difference between the amount of movement and a  
target value; and  
15 controlling the motor so that the object moves at a constant  
velocity, based on the difference.
24. A computer program product for driving a motor to move an  
object, the computer program product including computer executable  
20 instructions stored on a computer readable medium, wherein the  
instructions, when executed by the computer, cause the computer to  
perform:  
measuring an amount of movement of the object;  
calculating a difference between the amount of movement and a  
25 target value; and

controlling the motor so that the object moves at a constant velocity, based on the difference.